The Affective Forecasting Bias in Depressed and Non-Depressed Groups

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By

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Abstract

This study analyzed the influence of the affective forecasting bias on depressed and non-depressed groups. While the literatures on both affective forecasting and depression are robust, there are no studies to date which assess how the affective forecasting bias and the cognitive biases of depression might interact. The present study was able to replicate previous findings in the affective forecasting literature, where Forecasters predicted they would feel much worse after being rejected for a hypothetical date than did Experiencers who were actually rejected. The analyses of this bias in depressed groups failed, in part, due to insufficient group sizes. A preliminary potential moderator of the forecasting bias is reported and clinical applications are discussed.

The Affective Forecasting Bias in Depressed and Non-Depressed Groups

Affective forecasting refers to an individual's prediction of how he or she will feel in the future, given a specific outcome (Wilson & Gilbert, 2003). George Loewenstein (2003) suggests that "[e]ven when people can accurately predict the outcomes of their decisions, they may not be able to accurately predict the feelings associated with those outcomes" (p. 180). Thus, simply knowing the result of your actions does not necessarily mean you know how you will react to that result. People are generally good at forecasting valence and specific emotions (Loewenstein, 2003). When asked to consider a future event, the average person can accurately forecast whether or not they will feel positively or negatively. They can also predict with a fair amount of precision what emotions they will feel: sad vs. happy, angry vs. confused, etc. For example, if a person were asked to forecast how they would feel if they were offered a new and lucrative job, they would be able to predict that they would feel positively (as opposed to negatively) and rather happy and excited (as opposed to terrified or humiliated).

Nonetheless, individuals make inaccurate predictions with regard to the intensity and duration of their emotional reactions given specific outcomes. They have difficulty predicting the severity of their emotions, and how long those emotions will last. Both intensity and duration of their feelings tend to be overestimated by forecasters, as compared to what is actually experienced (Wilson & Gilbert, 2003). For example: if a person were to asked to forecast how they would feel if their favorite sports team won the championship game next week, they might predict that they would feel great and that these feelings would last for several days, or even weeks. However, what is more likely is that that individual will feel rather good that day, but those feelings would not continue to be as intensely positive for as long as anticipated.

This tendency to overpredict the intensity and duration of one's emotional response is called impact bias, and one potential cause of it is *focalism* (Wilson & Gilbert, 2005). Focalism occurs when people fail to take into account how other environmental factors will affect them, when asked to forecast their feelings given a specific future event. In this study, freshman college students were asked to predict their emotions following assignment to either a desirable or undesirable dormitory. The colleague students were not quite as happy in the desirable dormitory as had been predicted, nor were those students relegated to the undesirable dormitory as sad as predicted.

There are a variety of reasons supplied for why this forecasting bias occurs. In Wilson & Gilbert's (2005) dormitory study, the authors posit that the college students failed to take into account how other events and situations would alter their mood. There were other life events that surround and mollify the importance of the single, predicted event. The students may have thought that living in an unattractive dormitory would be terrible, but much of a college student's day is spent in class or perhaps at work. Living in an unpleasant place does not preclude enjoying life outside of that place. Alternatively, having a great place to live does not protect a person from fights with their partner or failing grades. Placing too much importance on one life factor may lead to bias, because there are so many other stimuli in our environment.

Wilson et al. (2004) also suggest that people fail to take into account how quickly they will be able to mentally work through the future event, so as to maintain their emotional well-being. This is termed immune-neglect. When forecasting negative events in particular, individuals appear to underestimate their level of skill in coping psychologically (Gilbert et al., 1998). Gilbert et al (1998) showed this bias in a variety of contexts, including broad scenarios like the termination of a relationship, and specific contexts like the tenure process of college

professors. In each of these situations, Forecasters over-predicted their emotional responses compared with the people that actually experienced them.

Finally, society and personal experience both have a strong impact on the feelings and emotions we attach to specific situations, as well as how we would personally react to them. In many cases a culture may share similar feelings toward a particular event ("Marriages are happy and celebratory occasions"), but that does not mean that they are always accurate ("Married Happily Ever-After"). In fact, entertainment media are abound with examples of protagonists dramatically pining over a relationship turned sour, their responses much more extreme than one might expect. Further, people do not always accurately judge how their *own* past experiences have made them feel. Gilbert and colleagues (1998) suggest that this combination of shared cultural expectations and personal experiences are bound to result in a number of inaccuracies in the way humans predict the future outcomes of specific events.

To summarize, the affective forecasting bias (among other things) causes individuals to predict more extreme impact of their emotions, given some future event, than they would if they actually experienced it.

Depression

Information-processing refers to the process whereby individuals sift through stimuli in their environment, and assign meaning to those stimuli. This process can help shape beliefs, as well as affect decisions and expectations. Biases in this area would serve to unduly influence the level of importance the individual places upon certain pieces of information, and subsequently the thought and decisions that the individual makes. Aaron T. Beck's (1967) cognitive model for depression suggests that people with depression are distinguished by their persistently negative views of the self, world, and future (the cognitive triad). In this way, a person experiencing a

depressive episode is likely to feel negative about their own self-worth, their immediate surroundings, and many of their upcoming endeavors. In addition to these negative (perhaps biased) cognitive processes, individuals experiencing a depressive episode exhibit negative affect, a loss of interest or pleasure in activities they previously enjoyed, as well as physiological abnormalities in their sleeping and eating patterns. Abramson, Metalsky, and Alloy (1989) have added to this theory by suggesting that depressed individuals may place a disproportionate amount of significance to what is perceived as a negative event, resulting in sustained hopelessness. Hopelessness, in turn, can produce the depressed affect, apathy, and physiological outcomes Beck's model describes (1967). In sum, depressive symptomatology can affect all aspects of the human condition, and have implications for perceptions of the past, present, and future.

There has been a long-standing interest in specifying the role of information-processing biases in the etiology and course of mood disorders (Clark et al., 1999). One particularly robust finding is a substantial memory bias that is exhibited by individuals suffering from depression (Williams et al., 2002). Depressed individual's past undertakings are often cognitively skewed in such a way as to make events seem more negative than they actually were. This biased view of the past ultimately affects the depressed individual's schemas and subsequently their perception of their current and future states (Beck et al., 1979). The literature also supports the notion that when depressed individuals perceive failure in future endeavors, they suffer from the same level of negative affect as they would if they ***actually*** failed (Beck et al., 1979).

Affective Forecasting and Depression

Although biases in affective forecasting and the cognitive biases associated with depressed individuals are robust constructs in the literature, there is no study to date which

analyzes the way depressed individuals would respond to the affective forecasting bias. In fact, when Wilson and colleagues (2004) conducted a study of the affective forecasting bias they deliberately excluded participants who scored higher than a 10 (mild depressive symptoms) on the Beck Depression Inventory. The question arises: do depressed individuals show the same kind of bias in their predictions of the future, and if not, how might they forecast differently? Since the general population seems to have some information-processing biases in the form of affective forecasting, it is plausible that a depressed group, which is already characterized by significant cognitive biases, may have a differential affective forecasting bias.

Hypotheses

Hypothesis 1

The first goal of this project is to successfully replicate the previous findings in the literature of affective forecasting in a non-depressed sample, specifically with regard to the affective forecasting bias. Thus, the first hypothesis is stated:

H1. In the non-depressed sample, Forecasters will predict that they would feel worse after being rejected by the date than Experiencers who actually are rejected.

Hypothesis 2

Second, I would like to determine the extent to which people with depression differ from non-depressed people in terms of the affective forecasting bias. It may be that the cognitive biases inherent to depression may cause affected people to differentially exhibit the affective forecasting bias, relative to non-clinical people. Thus:

H2a. In the depressed sample, Forecasters will predict that they would feel worse after being rejected by the date than Experiencers who are actually rejected.

H2b. Additionally, the depressed Forecasters and Experiencers will have a more pronounced bias than that of the non-depressed Forecasters and Experiencers (i.e. depressed Forecasters will be even more biased than non-depressed Forecasters).

Hypothesis 3

Finally, I plan to manipulate non-depressed groups in such a way as to mimic the biases I anticipate being evident in the depressed groups. Significant findings may help illuminate the field as to possible mechanisms by which the biases evidence in depressed populations might be perpetuated. Thus:

H3. In the non-depressed sample, Experiencers who are expecting to get rejected by the date and are put under cognitive load will report mood rating more similar to the depressed Experiencers, than other non-depressed Experiencers.

Method

Sample and Design

Participants (n= 181; 64% women) were recruited from pool of Psychology 100 Research Experience Program students and were distinguished as either “depressed” or “non-depressed” based on prescreening measures (BDI-I, described below). Students who reported BDI scores higher than 18 and less than 2 were invited via email to participate in our study. Only invited, prescreened participants were allowed to complete our study. Of this group, 167 were classified as non-depressed, in-session (≤ 19 on BDI-II; 92%), and 14 indicated moderate to severe symptoms of depression (> 20 BDI-II; 8%). This follows the recommended cut-off scores reported in the BDI-II manual, such that scores of 20-28 indicate moderate depression and 29-63 indicate severe depression (Beck, Brown & Steer, 1996).

Demographically, the average age of participants in this study was 19.1 years (*SD* = 3.66), and the sample largely identified themselves as white or Caucasian (85%, *n* = 154). Of the remaining participants, 11 students identified themselves as African American (6%), 11 more identified themselves as Asian (6%), and the remaining participants indicated 'other' (3%).

The study design is essentially a 2 (Forecaster/Experiencer) x 2 (Depressed/Non-depressed), with a fifth group of non-depressed Experiencers with an additional manipulation (described in detail below).

Measures

Depression. The Beck Depression Inventory (BDI-I) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a measure of depression symptoms with satisfactory test-retest reliability (Beck, Steer, & Garbin, 1988; Steer, Beck & Garrison, 1986). It is a 21-question self-report scale with items ranging in value from 0 to 3, thus possible scores are 0 (minimal depression) to 63 (high depression). This measure was used during prescreening to identify individuals as either depressed or non-depressed.

The BDI-II (Beck, Steer, & Brown, 1996) is the most current revision of the Beck Depression Inventory. This instrument is a widely used and well validated measure. It is a 21-item self-report instrument used to assess the existence and severity of symptoms of depression.

Coping. The Brief COPE (Carver, 1997) is an attenuated version of the COPE inventory (Carver, Scheier & Weintraub, 1989) with 28 items and 14 subscales. It is used to assess which coping strategies participants have used in a recent troubling situation with items such as "I've been saying to myself 'this isn't real'". Each of the items are measured on a four-point scale with the anchors labeled "I haven't been doing this at all" and "I've been doing this a lot."

Procedure

Drawing on the paradigm used by Wilson et al. (2004), the design used in this study was that of a dating game. Each participant was met by a trained member of the study personnel individually, and was given a packet of information detailing the basic procedure of the experimental session. After the participant had given their consent, they were told that they would take part in a game that was intended to assess heterosexual dating processes. From this point on, the participant believed that they had been randomly assigned to a three-person group of study participants from different universities, who interacted via internet. The group ostensibly consisted of the actual participant, a person of their same gender, and a third person of the opposite gender. In truth, there was only one participant and the other two "members" were created for the purpose of the study. Our participant was ostensibly competing against the participant of the same gender (the Competitor), to gain a hypothetical date with the third participant (the Judge). This third "participant" would read personal information and see a picture from each of the other two participants.

To bolster the deception, a picture was taken of our participant with a digital camera and then the study personnel connected the camera to the computer via USB cable to upload the picture to the Judge. For reasons of confidentiality, the study personnel deleted the pictures from the digital camera before the end of the session and no pictures were actually uploaded to another computer. Then, the participant was given a computer and started the dating game.

To assess baseline mood, the participant was given two items on a 1-9 scale ("How positive or negative is your mood right now?" 1: Extremely Negative, 9: Extremely Positive; "How happy do you feel right now?" 1: Not at all Happy, 9: Extremely Happy). These items have been used in prior research (Wilson et al., 2004) to establish mood. Then, the participant

was logged in to the network, and saw a loading screen for approximately 12 seconds. The basic game was again described to the participant, and they saw a picture of the Judge to help strengthen the cover story. Next, the participant was prompted to supply some personal information to help the Judge decide between themselves and the Competitor. There were six boxes with headings like "Major/Minor," "Annoying Habits," and "Proudest Moment" that the participant had to click on and enter information. When they had entered information into each box, another loading screen came up, and the participant was instructed to wait while "a separate experimenter checked these responses and then relayed them" to the Judge.

After the participant was assured that their responses had been relayed, they had the opportunity to view some personal information supplied by the Judge, by clicking on six boxes with headings like "Major/Minor," "Annoying Habits," and "Proudest Moment". The information therein was held constant across all participants, and were appropriate responses for either gender of respondent (e.g. "I like to hang out with my friends and maybe go to one of the parks in town. Sometimes I go bowling with my friends which is good for a laugh..."). This was again done to bolster the cover story, but also so that the participant would feel a stronger connection with the Judge. This was done under the assumption that the more real that person seemed to them, the more engaged they would be in the experiment.

The end of the game varied, depending on whether the participant was in the Forecaster or Experiencer condition. Forecasters were ultimately asked to predict how they *would* feel, if they were rejected by the Judge. This was assessed using an adjusted version of the baseline mood measure (e.g. "How positive or negative would your mood be if you were rejected for the date?" 1: Extremely Negative, 9: Extremely Positive). In the Experiencer condition, participants saw another waiting screen while the Judge "made their final decision" between the two

participants. Then, the participant was told they had been rejected by the Judge. The original mood measure was used to assess their mood directly after this information was given to them.

A final manipulation was given to some non-depressed participants. Participants in this condition were Experiencers who, before being told they had lost the date, were informed that the Judge had reviewed half of the available information and had determined that the participant had a 98.5% chance of losing the date. This number has been borrowed from previous research to convey that the likelihood of losing the date is all but certain (Wilson et al., 2004). This manipulation is intended to cause the participants to initially feel negatively about the date, although the literature suggests that inherent cognitive strategies will take over to reduce cognitive dissonance and minimize the overall effect on the non-depressed participants (Festinger, 1957; Simon, Greenberg & Brehm, 1995). To reduce their ability to employ such strategies, participants in this condition were also given a cognitive load task, intended to impair their executive functioning. This was done with a well-established method (Gilbert & Hixon, 1991; Bargh & Chartrand, 2000; Tobin & Weary, 2003) where participants are given twenty seconds to memorize an 8-digit number, and then must continually rehearse this number until the end of the condition. Research in this field suggests that such a task should hinder higher-level thinking, which is required to effectively perform the strategies a non-depressed individual normally would to reduce the amount of cognitive dissonance they are theorized to experience. Under this cognitive load, participants were then told they had been rejected, had their mood assessed, and then entered their 8-digit number. For a summary of each of the five conditions, see Table 1.

After all participants indicated their post-game mood, the experimenter read them a partial debriefing statement which indicated the deception inherent to the game. Great lengths

were taken to assure that the participant knew their personal information had not been evaluated in any way, and that every single participant received the same feedback. The participant was allowed to ask any clarifying questions, and then the second half of the study began. This included the electronic assessment of all other study questionnaires (except the BDI-I).

Results

To analyze pre- and post game mood, the two items (described in the methods section above) used to assess mood were averaged together to produce total pre-game and post-game mood scores, pre-game: $r(179) = .83$, $p < .0001$; post-game: $r(179) = .75$, $p < .0001$. The primary dependent variable for each analysis was change in mood. I applied each of two common ways to calculate change in a variable between two time points[1]. First, I used the residualized change score model. These scores are calculated by using a regression model in which the prior measure serves as a predictor of a subsequent measure of the same construct. Residuals from this regression are outputted and serve as the measure of residualized change. Second, I used gain scores. Gain scores are calculated by subtracting post-game mood from pre-game mood (pre-game mood – post-game mood = gain score). Because participants in this study were expected to generally respond by indicating a post-game mood that was lower than their pre-game mood (in other words, their interaction with the game made them sadder), a higher gain score indicated a participant that experienced an increase in negative affect.

Hypothesis 1. As a replication of Wilson et al.'s (2004) work, the first hypothesis was that non-depressed (BDI-II ≤ 19) Forecasters would predict a more negative post-game mood than the post-game mood reported by non-depressed Experiencers. To examine this, I first used the residualized change model. In this model, there was a significant effect of condition (Forecasters vs. Experiencers[2]) on mood $F(2, 113) = 13.44$, $p = .0004$, $d = .48$ (a small effect; Cohen, 1988).

After adjusting for participants' pre-game moods, Forecasters (n = 62) predicted an average post-mood of 4.67 (SD = 1.78), whereas Experiencers (n = 54) reported a significantly less negative average post-game mood of 5.56 (SD = 1.90).

Using the gain scores to examine the same question, there was also a significant difference between mood forecasted by non-depressed Forecasters and the mood experienced by non-depressed Experiencers $F(1, 114) = 9.89$, $p = .0021$; $d = .59$, a medium effect. Whereas Forecasters predicted a mean mood of 2.08 (SD = 1.40), Experiencers reported experiencing a mean mood of 1.26 (SD = 1.40), indicating a modest increase in the negativity of their moods.

H1 states that non-depressed Forecasters will predict that they would be significantly sadder if they lost the date than Experiencers who are actually rejected. The above analyses are both significant and in the predicted direction of *H1*, therefore *H1* was supported.

Though not a primary hypothesis, I also examined whether there was an interaction of gender and condition on mood, using the residualized change model. There was no interaction between condition and gender in predicting change in mood from pre to post dating game, $F(4, 125) = 0.18$, $p = .68$, so gender was not used in subsequent analyses.

Hypothesis 2. For *H2*, I had only planned to analyze depression from a binary, categorical view (depressed = BDI-II ≥ 20; non-depressed = BDI-II ≤ 19). Given sample size concerns, however, I also analyzed depression as a continuous variable. *H2a* predicts that depressed Forecasters will predict sadder mood scores than will depressed Experiencers. Using the residualized change model, a non-significant effect of condition on mood was outputted, $F(2, 11) = 1.35$, $p = .26$, with an effect size of Cohen's $d = .44$; a medium effect. The depressed Forecasters (n = 7) reported an average post-game mood of 3.40 (SD = 1.93). This is less than that of the depressed

Experiencers (n = 7) who averaged 4.25 (SD = 1.93), a direction that is consistent with the affective forecasting bias, but not at a significant level:

When examining this hypothesis with a gain score model, I failed to find a significant effect of condition $F(1, 12) = .31$, $p = .59$, $d = .30$. Again, depressed Forecasters reported numerically more negative mood scores (M = 1.21, SD = 1.32) than did their depressed Experiencer counterparts (M = .64, SD = 2.39), but this difference was not significant.

H2b. This portion of the hypothesis predicts a significant interaction between condition and level of depression, resulting in a more pronounced forecaster bias in the depressed group than the non-depressed group. Using the residualized change model, there no evidence of an interaction between depression and condition, $F(4, 125) = .03$, $p = .86$. A similar non-significant result was obtained with the parallel gain score model, $F(3, 126) = .09$, $p = .76$.

Given the small number of participants in the depressed group, I also examined this hypothesis using BDI-II scores as a continuous variable. Using both the gain score approach and the residualized change approach, neither of the interactions of interest (i.e., BDI-II by condition) were significant (ps > .4).

As both the residualized change and gain score models converge on the non-significance of forecaster bias in the depressed group and the non-significant moderating effect of depression on mood, *H2a* and *H2b* were not supported.

For a summary of these first two hypotheses, refer to Figures 1 and 2.

Hypothesis 3. Of the 51 participants in the non-depressed cognitive load Experiencer group, 47 were able to correctly report the 8-digit number given to them. The remaining 4 made small errors (incorrectly reporting one or two of the digits; Gilbert & Hixon, 1991), therefore all

participants were rehearsing the number appropriately and can be said to have been cognitively busy.

H3 originally was designed as a comparison between depressed Experiencers and non-depressed Experiencers who were under cognitive load. This was predicated on the assumption that the depressed sample size would be larger, and that there would be a significant interaction between depression and condition. Since neither of these assumptions were met, I have analyzed *H3* as a comparison between Experiencers under cognitive load and other non-depressed Experiencers.

Using the residualized change model, these Experiencers under cognitive load did not report significantly different mood than did the non-depressed Experiencers from *H1*, $F(2, 102) = 0.19$, $p = .66$; $d = .07$, which does not meet the lowest cut-off of $d = .20$, a small effect. The means in Table 2 indicate that the cognitive load Experiencers were very slightly happier than were the other non-depressed Experiencers. The gain score model yields similar results, $F(2, 102) = 0.19$, $p = .66$; $d = .08$. This pattern of results suggests that these two groups of non-depressed Experiencers were responding to the date rejection in a similar way. Due to the adequate size and comparability of these two groups, and since they responded so similarly, *H3* must be rejected.

Exploratory Analyses

In addition to the hypotheses reported and analyzed above, some exploratory analyses were performed using the 14 subscales from the Brief COPE as moderators of the effect of condition. One interesting finding was from the subscale Denial, which assesses the degree to which a person denies the reality of a situation as a coping mechanism for negative events. Denial had a significant moderating effect on condition, $F(4, 125) = 5.04$, $p = .03$. To understand

this interaction, I calculated the correlation between denial and mood separately among Forecasters and Experiencers. Whereas the correlation between denial and mood was not significant for Forecasters, $r(67) = .08$, $p = .51$, Experiencers correlation was significant, $r(67) = -.30$, $p = .01$. This suggests that while Forecasters were relatively unaffected by their use (or disuse) of the denial coping strategy, Experiencers who used it tended to be sadder following their rejection. In other words, the Experiencers appear to be driving the effect of this interaction of denial and condition. The implications of this finding are discussed below.

Discussion

This study is largely supportive of prior research in the area of affective forecasting, and finds further support for the affective forecasting bias. Our non-depressed Forecasters predicted they would have felt much worse if they had been rejected for the date than did the non-depressed Experiencers who were actually rejected. This replication of findings is of relatively small importance to this robust literature, but it suggests that the present design had adequate manipulations.

The dating game paradigm was appealing in that it taps a social interaction in which our college sample would be interested. Students entered the study believing they were actually interacting with another student, and in a generally familiar context: the dating world. This is a staple of the college experience, and one that was intended to elicit more natural responses in an otherwise tightly controlled laboratory setting. Although the dating game paradigm has been successful in at least one previous study (Wilson et. al, 2004), the electronic stimuli used in this study were slightly different from previous studies. While some of the information given to participants was shared between this previous study and the present one, such as the labels for the personal information boxes, there were differences as well. Different programs were used to

construct the study stimuli, which led to entirely different screen-layout and other visual stimuli. Additionally, in a deceptive design, there is always the matter of the participant *actually* being deceived by the study. The statistically successful replication of the affective forecasting bias supports the notion that the study design was adequately appropriate and engaging.

While it seems likely that the basic procedure and manipulation were able to detect signal, the lack of statistical power unfortunately precludes definitive conclusions of the differences in depressed and non-depressed groups. It would be unwise to make any definitive statements, in general, about the role of depression in the affective forecasting bias based on these results.

With regard to Hypothesis 3, there were certainly enough participants to adequately compare with the other non-depressed groups. Unfortunately, while the non-depressed Experiencers and Experiencers under Cognitive Load encountered substantially different manipulations, they reported nearly identical moods. Since the cognitive load and negative expectations manipulation has never before been attempted in the affective forecasting literature, it has no prior basis for being a viable manipulation.

Next, there is very preliminary evidence for the coping strategy of denial being a potential moderator for the affective forecasting bias. These analyses were not a part of any prior hypothesis, and as such must be treated as exploratory. However, it appears that Experiencers who used the coping mechanism of denial had a much worse mood than Experiencers who did not. So, people who respond to trials in their life by putting themselves mentally in another place and pretending it isn't happening are the worse for it. Interestingly, use or disuse of this coping mechanism did not seem to affect the Forecasters positively or negatively. This suggests that coping mechanisms may not actually come into play when an individual is making predictions

about their feelings. This is consistent with the theory posited by Gilbert and colleagues (1998) which suggests that the psychological immune system may not be prophylactic when one imagines future negative events and the subsequent negative emotional reactions. Of course, the question becomes: if non-use of coping mechanisms in the prediction of negative future events causes the forecasting bias, what happens when the event predicted is positive and no coping mechanism is necessary? This will be addressed in the final section.

Potential Clinical Implications

Few ties between the affective forecasting literature and the clinical psychology have been made. However, there are potentially important implications of the affective forecasting literature for clinical psychology and the findings of the present study (though not definitive) are worth considering in this context. No differences of affective forecasting bias based on level of depressive symptoms were identified. Although I failed to find evidence of an affective forecasting bias in the depressed sample, it may be that larger studies would have found such a relationship. Indeed, the effect size for the difference between Forecasters and Experiencers was fairly comparable across depressed and non-depressed groups.

Even if depressed people do not show a greater bias in affective forecasting, it may be that this bias would be of special importance among depressed people – if, for example, it serves to maintain avoidance. Avoidance has been identified as an important maintaining factor in depression (Jacobson, Martell & Dimidjian, 2001). It would not be surprising if the tendency to expect intense, long-lasting negative emotional reactions was related to avoidance behaviors. Therefore, future studies might examine not only the magnitude of the affective forecasting bias among depressed people, but also interventions designed to reduce this bias facilitate approach (as opposed to avoidance) behaviors.

Though my finding regarding denial is clearly exploratory and should be regarded as preliminary, it is interesting to consider the ultimately implications of this finding if replicated. People who are depressed and tend to use avoidance or denial related coping strategies may have at least two important factors maintaining their emotional difficulties. First, like their non-depressed peers, they may exhibit an affective forecasting bias. Though not addressed by the data I collected, it seems likely that this bias could serve to maintain avoidance. Second, to the extent that people engage in denial as a coping strategy, they may actually exacerbate their negative experiences when bad outcomes do occur. This would actually serve to make them look less biased in their affective forecasting. If these possibilities are borne out by future research, it raises the possibility that interventions might target both affective forecasting biases (in the service of counteracting avoidance behaviors) and interventions might target avoidance-related coping strategies such as denial (as they may exacerbate or prolong negative emotional experiences).

Future Studies and Limitations

Future studies need to address the following issues. First, a larger depressed sample is necessary to tease out the actual differences (if any) between depressed and non-depressed groups with regard to affective forecasting. With a sample size of 14 depressed people, sample size is a major limitation of the present study.

Second, this study was largely conducted using a combination of the experimental software MediaLab and webpage designing software. This allowed for every keystroke of the participant to be operationalized and accounted for by the experimenter, but also had the limitation of not actually interacting with the other “participants” in the dating game. This increases the internal validity of this study, allowing the experimenter to exactly replicate all

stimuli in the study for each participant, but in so doing also reduces the ecological validity of the study. Some may criticize this research method as being an unrealistic task, as the social interaction occurring during the manipulation does not actually include another physical human-being.

However, with the recent rise of social interaction via internet, this game may have increasing ecological validity. With the advent of social networking and dating websites, humanity is evolving the term “relationship” to keep up with the ever advancing technology. This, in combination with the successful replication of the forecasting bias found in previous studies with more ecological validity (Wilson & Gilbert 2005) suggests this is a minor limitation.

Finally, the coping mechanism, denial, may moderate the affective forecasting bias. Further investigation of this coping strategy, in this context, needs to be explored. Predictions based on the exploratory results from this study would state that these coping mechanisms may play a role in the way individuals actually experience the event, but not how they predict they will experience it. The role of the psychological immune system in a forecasting context may be important in discovering how individuals can become better predictors of their own feelings.

Footnotes

[1] Whereas some researchers recommend the use of residualized change scores rather broadly (Cohen & Cohen, 1988); others recommend the use of gain scores for most analyses (Singer & Willett, 2003). In a review of this literature, Paul Allison (1990) has suggested that the gain score method may be viable so long as there is no causal effect of scores at time 1 on scores at time 2. Ultimately, as this is not always known with certainty, Allison suggests that perhaps the best method of analyses in this situation is to use both models and only accept the results when the two agree. Thus, both residualized change scores and gain scores will be reported in the following analyses.

[2] Note that this group does not include data from the group of non-depressed Experiencers who were put under cognitive load.

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Table 1

Summary of Conditions

Depressed	Non-Depressed
Forecasters	Forecasters
Experiencers	Experiencers
	Experiencers with high probability of losing date and cognitive load task

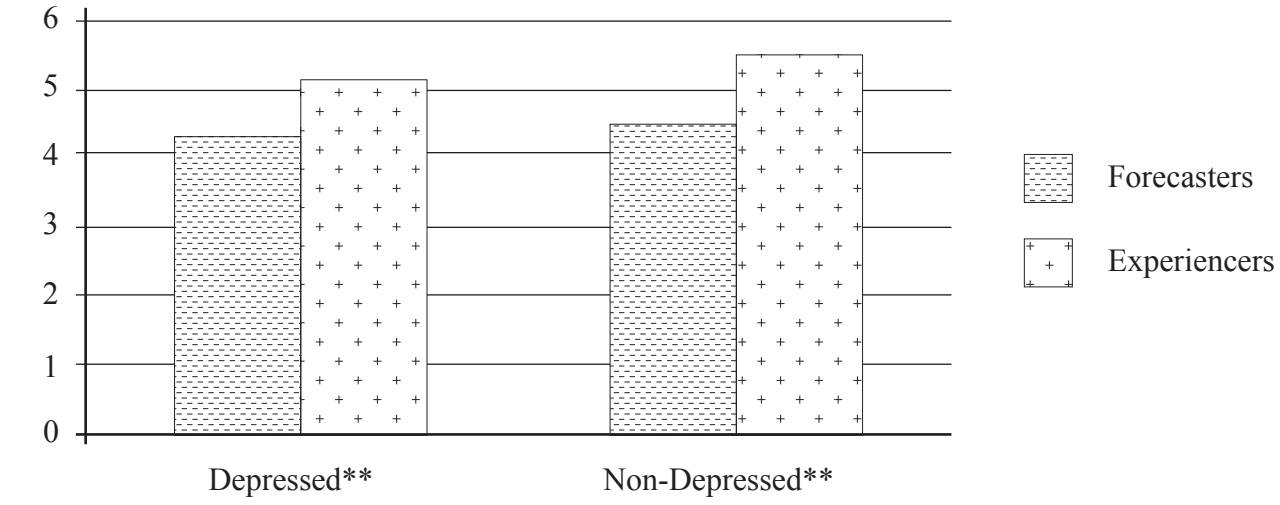
Table 2

Summary of Mean and Standard Deviations by Condition and Group

	Depressed				Non-Depressed			
	Residualized Change		Gain Score		Residualized Change		Gain Score	
	M	SD	M	SD	M	SD	M	SD
Forecasters	3.40	1.93	1.21	1.32	4.67	1.78	2.08	1.40
Experiencers	4.25	1.93	.64	2.39	5.56	1.90	1.26	1.40
Experiencers with Cognitive Load	N/A	N/A	N/A	N/A	5.69	1.91	1.14	1.47

Figure 1.

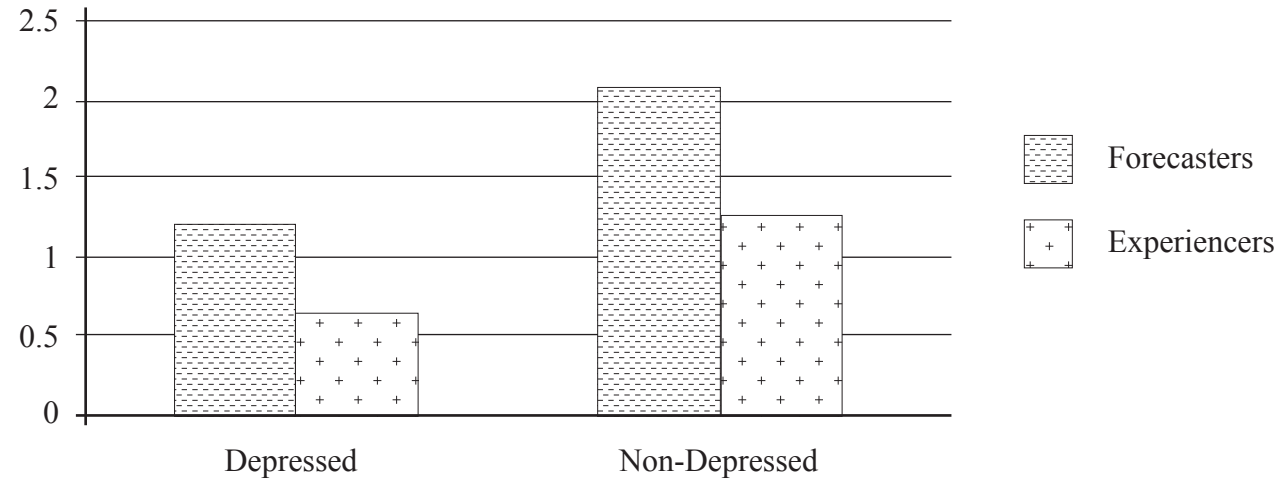
*Mood Residualized Change Scores**



Note. *Scores are fitted to the original scale. **Higher scores indicate more positive affect.

Figure 2.

*Pre-/Post Game Mood Gain Scores**



Note. *Larger gain score indicates more negative affect.